AMENDMENTS TO THE CLAIMS

1. (Previously presented) A radar comprising:

a transmitter transmitting a transmission signal having an alternately repeating upstream-modulation section in which a frequency gradually increases and a downstream-modulation section in which the frequency gradually decreases;

a receiver receiving a reception signal serving that is a reflection signal of the transmission signal reflected from a target;

an analyzer acquiring data on a frequency spectrum of a beat signal for the transmission signal and the reception signal;

an extractor extracting, from among a plurality of first projecting portions appearing in the frequency spectrum of the beat signal in the upstream-modulation section and a plurality of second projecting portions appearing in the frequency spectrum of the beat signal in the downstream-modulation section, a pair of projecting portions resulting from reflection of the transmission signal by the target; and

a detector detecting a distance to the target and a relative speed with respect to the target in accordance with frequencies of the extracted pair of projecting portions, wherein

the extractor further predicting a center frequency of peak frequencies of the first and second projecting portions at a point in time after a predetermined time based on a peak frequency of the first projecting portion at the predetermined time, and extracting the pair of projecting portions acquired at the point in time in accordance with the center frequency.

2. (Previously presented) A radar comprising:

a transmitter transmitting a transmission signal having an alternately repeating upstream-modulation section in which a frequency gradually increases and a downstream-modulation section in which the frequency gradually decreases;

a receiver receiving a reception signal serving that is a reflection signal of the transmission signal reflected from a target;

an analyzer acquiring data on a frequency spectrum of a beat signal for the transmission signal and the reception signal;

an extractor extracting, from among a plurality of first projecting portions appearing in the frequency spectrum of the beat signal in the upstream-modulation section and a plurality of second projecting portions appearing in the frequency spectrum of the beat signal in the downstream-modulation section, a pair of projecting portions resulting from reflection of the transmission signal by the target; and

a detector detecting a distance to the target and a relative speed with respect to the target in accordance with frequencies of the extracted pair of projecting portions, wherein

the extractor further predicting a center frequency of peak frequencies of the first and second projecting portions at a point in time before a predetermined time based on a peak frequency of ~~a~~ the second projecting portion at the predetermined time, and ~~for~~ extracting ~~a~~ the pair of projecting portions acquired at the point in time in accordance with the center frequency.

3. (Previously presented) The radar according to Claim 1, wherein

the extractor extracts the pair of projecting portions by using, as the point in time, nT satisfying a relationship, $nT \approx fo/(2\Delta F \cdot fm)$, wherein n represents a natural

number, T represents a measurement cycle in which frequency analysis is performed, 1/fm represents a modulation cycle including the upstream-modulation section and the downstream-modulation section, fo represents a center frequency of the transmission signal, and ΔF represents a width of a frequency shift in the upstream-modulation section and the downstream-modulation section.

4. (Previously presented) A radar comprising:

a transmitter transmitting a transmission signal having an alternately repeating upstream-modulation section in which a frequency gradually increases and a downstream-modulation section in which the frequency gradually decreases;

a receiver receiving a reception signal serving that is a reflection signal of the transmission signal reflected from a target;

an analyzer acquiring data on a frequency spectrum of a beat signal for the transmission signal and the reception signal;

an extractor extracting, from among a plurality of first projecting portions appearing in the frequency spectrum of the beat signal in the upstream-modulation section and a plurality of second projecting portions appearing in the frequency spectrum of the beat signal in the downstream-modulation section, a pair of projecting portions resulting from reflection of the transmission signal by the target; and

a detector detecting a distance to the target and a relative speed with respect to the target in accordance with frequencies of the extracted pair of projecting portions, wherein

the extractor further predicting a center frequency of peak frequencies of the first and second projecting portions at a predetermined time by using the peak frequency of the first projecting portion at a first point in time before the predetermined

time and the peak frequency of the second projecting portion at a second point in time after the predetermined time, and extracting the pair of projecting portions acquired at the predetermined time in accordance with the center frequency.

5. (Previously presented) The radar according to Claim 4, wherein,

the extractor excludes a combination of the first and second projecting portions at the predetermined time from pair candidates:

when a second projecting portion forming the pair with the first projecting portion at the first point in time that is used for predicting the center frequency and that exhibits a frequency difference substantially equal to a difference between the peak frequencies of the first and second projecting portions forming the pair at the predetermined time does not exist, and/or

when a first projecting portion forming the pair with the second projecting portion at the second point in time that is used for predicting the center frequency and that exhibits the frequency difference does not exist.

6. (Previously presented) The radar according to Claim 2, wherein

the extractor extracts the pair of projecting portions by using, as the point in time, nT satisfying a relationship, $nT \approx fo/(2\Delta F \cdot fm)$, wherein n represents a natural number, T represents a measurement cycle in which frequency analysis is performed, 1/fm represents a modulation cycle including the upstream-modulation section and the downstream-modulation section, fo represents a center frequency of the transmission signal, and ΔF represents a width of a frequency shift in the upstream-modulation section and the downstream-modulation section.

7. (New) The radar according to Claim 1, wherein,

the extractor excludes a combination of the first and second projecting portions at the point in time from pair candidates:

when a second projecting portion forming the pair with the first projecting portion at the predetermined time that is used for predicting the center frequency and that exhibits a frequency difference substantially equal to a difference between the peak frequencies of the first and second projecting portions forming the pair at the point in time does not exist.

8. (New) The radar according to Claim 7, wherein

the extractor extracts the pair of projecting portions by using, as the point in time, nT satisfying a relationship, $nT \approx fo/(2\Delta F \cdot fm)$, wherein n represents a natural number, T represents a measurement cycle in which frequency analysis is performed, 1/fm represents a modulation cycle including the upstream-modulation section and the downstream-modulation section, fo represents a center frequency of the transmission signal, and ΔF represents a width of a frequency shift in the upstream-modulation section and the downstream-modulation section.

9. (New) The radar according to Claim 2, wherein,

the extractor excludes a combination of the first and second projecting portions at the point in time from pair candidates:

when a first projecting portion forming the pair with the second projecting portion at the predetermined time that is used for predicting the center frequency and that exhibits a frequency difference substantially equal to a difference between the peak

frequencies of the first and second projecting portions forming the pair at the point in time does not exist.

10. (New) The radar according to Claim 9, wherein

the extractor extracts the pair of projecting portions by using, as the point in time, nT satisfying a relationship, $nT \approx fo/(2\Delta F \cdot fm)$, wherein n represents a natural number, T represents a measurement cycle in which frequency analysis is performed, 1/fm represents a modulation cycle including the upstream-modulation section and the downstream-modulation section, fo represents a center frequency of the transmission signal, and ΔF represents a width of a frequency shift in the upstream-modulation section and the downstream-modulation section.